Cost and Management

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Associate Professor of Accounting at Washington University in St. Louis, Dr. Bedford received his M.B.A. from Tulane University and his Ph.D. from Ohio State. He is a Certified Public Accountant and has obtained extensive experience in the public accounting field. An author of note, Dr. Bedford has written technical articles for the *Accounting Review* and the *Ohio Retail Analyst*.

Mr. Mackenzie has been with the Bell Telephone Company of Canada since 1908, and for the past seven years has served as Assistant Vice-President, Labour Relations. He is a graduate of the University of Toronto where he received a B.A.Sc. degree and was recently honoured with the Coronation Medal for his services as secretary of the Bell Centre of the St. John Ambulance Association. "Office Wage Administration" was the subject of an address given by Mr. Mackenzie at the November meeting of the Montreal Chapter of the Society of Industrial and Cost Accountants.

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Editorial Comment . . .

Management Accounting

It is said that some aspects of payroll control and distribution were used by the Egyptians during the construction of the pyramids. We know that a form of debit and credit was practised by the accountants and comptrollers in the Venetian commercial world. Financial accounting has been well understood through balance sheet and P & L for over a hundred years. Modern cost accounting really started with the advent of standard costs thirty years ago. Thus has grown the science and art of accounting as a specialized profession.

We often hear now the phrase, "management accounting" or to describe it more fully, the managerial approach to industrial accounting.

Some of the questions that come to mind on seeing this phrase are. Is this a new form of accounting? How does it differ, if at all, from present accounting methods? What is its significance to accountants today?

Most of us think and know that accountancy and its service through financial and cost accounting is an important part of the management team. However, the fact that the term management accounting is coming into use puts a different connotation to accounting in general. It suggests a wider and more significant application to management's problems than a once a year or quarterly set of statements and such is the case.

In the last three to five years at least two noteworthy books have attempted to deal with accounting on the broader base suggested by management accounting.

These volumes are *Management Planning and Control* by B. Goetz and *Managerial Economics* by Joel Dean.

Management accounting may be defined as an accounting method which will supply economic information as needed by Management. It is obvious both cost and financial accounting can do this but do they? The managerial objectives of accounting are to provide data to help management plan and control operations. The accounting problem is to provide a framework in which to select, classify and evaluate the proper data as needed. It must be flexible to the point of allowing alternate possible courses of action! It is apparent also that a certain blend of economics and accounting takes place in this process of management accounting. For example, marginal cost concepts are common to both the field of accounting and economics.

EDITORIAL COMMENT

Accounting may be said to be a study of the economic factors of a single management. In earlier days and to a large extent today, management was forced to play the economic game largely by ear or by a sort of sixth intuitive sense.

Today, however, managerial problems are becoming more complex. This is due to reasons obvious to all. Industrial processes themselves are more complicated and hence more difficult to explain in correct terms of cost and income. The rate of production and the frequency of style and model changes all mean that decisions to make or buy, or to produce at all, bring very quickly to management, the problems of alternative methods and the economical lot. The increasing social impact on business and the responsibilities accruing thereby to management all come to the attention of the accountant.

All of these considerations point up the increasing importance of accounting and have given rise to the term, "management accounting".

It becomes fairly clear then that the management accountant is concerned not only with the traditional accounting method but must now think also in terms of the contribution margin approach, cost increments and opportunity profits. These and other management techniques employed in other times by considered guess are rapidly becoming part of formal or informal accounting practice. Direct costing, for example, is an attempt to give formal accounting treatment to marginal cost theories.

All of this presents a challenge to accountants of our time. They must be prepared to give studied assistance to management on these difficult economic problems of business. Because of the economics and social pressures on individual business concerns they must understand and be able to apply cost and income techniques not always inherent in the debit and credit system. It indicates a flexibility of approach and a sense of vision for which the profession has not hitherto been noted.

It presents a challenge and is also a problem to our educational system to provide the type of training needed for the management accountant. Post-graduate courses for the development of executive accountants are in operation in several centres this Winter. The accounting magazines are filled with articles on the newer problems of business. All of this clearly demonstrates that management accounting is not a catch phrase but is in process of accomplishment. All practising accountants would do well to prepare for the increasing responsibilities that management accounting will bring.

Management Accounting . . .

By GEORGE MOLLER, D.Jur., C.A., R.I.A.

Evaluation of a Panel Discussion

The 1953-54 programme of the Hamilton Chapter of the Society of Industrial & Cost Accountants of Ontario, is devoted entirely to Management Accounting.

The programme folder carries the following definition, taken from the papers on "The Accountant in Industry" to the 6th International Congress on Accountancy held in 1952 in London, England:

> "Management Accounting is the presentation of accounting information in such a way as to assist Management in the creation of policy in the operation of an enterprise. The Management Accountant must be an integral part of the managerial team; he must serve this group in the execution of their managerial functions of planning, organizing, directing, coordinating and controlling, in the best possible way by creating and operating Management Accountancy".

The first meeting of the Chapter was devoted to a panel discussion on the subject "Management Accounting". The panel members were:

J. D. Campbell, General Manager, Appliance Electronics Division, Canadian Westinghouse Company Limited, Hamilton.

E. H. Ambrose, C.A., Partner, Clarkson, Gordon and Company, Hamilton

C. Powell Morgan, Vice-President and Comptroller, International Silver Company of Canada Limited, Hamilton

R. A. Morris, Vice-President and Comptroller, Dominion Foundries and Steel Limited, Hamilton

The discussion was introduced with quotations from William E. Thomas' "Accounting and Its Managerial Uses" (*Business Management Service, College of Commerce and Business Administration Bulletin,* University of Illinois, Urbana):

> "Managers of all business enterprises need to keep some records to provide them with information essential to reaching decisions and formulating plans and policies.
>
> In order for an executive to reach a decision, he must have pertinent information.
>
> Some of this information is obtained from within the business, and other information relates to conditions outside the business. The executive correlates the information in such a way as is necessary to solve the problem at hand."
>
> This executive is the Management Accountant.

Mr. Campbell, representing general management, chaired the panel and introduced the first question—"What is Management Accounting?"

The Chairman developed the following 7 main points which, in his opinion, are the requirements for proper Management Accounting:

1. Imagination
2. Understanding of Management problems and requirements
3. Speed and accuracy
4. Minimum amount of ways in presentation
5. Standardization of comparison
6. Essentiality of bench marks
7. Development of trends

The panel examined and discussed each point. In effect, the panel seemed to agree that all these ingredients are required for good Management Accounting.

Mr. Ambrose tried to add "common horse sense" to the requirements but was informed that this requirement is adequately covered by the imagination of the Management Accountant.

On the second question, whether Management Accounting is a new technique or branch of accounting, the panel seemed to agree that Management Accounting is not a new technique but rather the systematic use and combination of several well-known techniques and approaches which have been developed, particularly in the last two decades. The recognition of the systematic application of Management Accounting and its further development is of comparatively recent vintage.

No unanimity could be achieved on the question who should perform the functions of Management Accounting. Although the three members of the panel who are trained accountants agreed that the member of the management team educated and experienced in accounting is the most logical choice for this function, Mr. Ambrose said that in small enterprises the owner-manager, himself, will perform the functions of Management Accounting. Other members of the panel and opinions from the floor indicated that it is easily conceivable that the industrial engineer assumes the management accounting function and that even the economist may challenge the accountant's privilege to this function if the accountant doesn't quickly perceive his opportunity of interpreting and arranging his knowledge in a way understandable and intelligible to the manager who could use this knowledge only if it is served to him in a digestible form and thus can be used as a basis for policy-making decisions.

Mr. Morgan led the discussion on the types of information for Management Accounting. The panel stressed the necessity for briefness and the possible alternatives dictated by the person representing management whether the Management Accountant should present figures or rather facts and conclusions derived from the figures assembled by him.

Mr. Ambrose presented an information sheet which, on one page, contained all the interesting operating figures, day to day, for the

information of management, starting from the cash position up to the production and shipping volume and unit costs.

Mr. Morris emphasized that in his Company all important figures are available to Management 36 hours after the closing of the day to which the report referred. These figures even include a day-to-day profit figure.

Mr. Morgan stressed the necessity of checking from time to time whether the reports prepared by the Management Accountant are actually used by the operating Manager.

In examining to what extent the Management Accountant should actually go in eliminating faulty practices (for instance, waste in any particular department or operation), the opinions varied but the members agreed that tact and diplomacy are required if co-operation by the operating management should be achieved.

In the discussion from the floor, James L. Peirce, Comptroller of A. B. Dick Company, Chicago, was quoted "Controllership & Accounting: A Contrast", in the September 1953 issue of *The Controller*, to the effect that the controller must not make operating decisions or take operating responsibilities. Although Mr. Peirce wants to distinguish between the Comptroller and the Management Accountant, the rule that operating decisions are a line and not a staff function must be observed by the Management Accountant as well.

Some confusion became apparent on the Management Accountant's function in decentralized large concerns where an operating division, as, for instance, in Westinghouse, is comparatively self-sufficient in its operations. The discussion failed to clarify the fact that in an organization of that kind the financial officer of the total concern exercises management accounting functions in the realm of the holding company; the frame of a big corporation as the quoted one should be visualized as a holding concern only and the management accounting programmes are therefore for this holding unit different from that of an operating unit. Each of the operating divisions of this concern will have to have a Management Accountant of its own who, of course, will not be concerned with the procurement of operating funds and inter-company profits which two matters will be the exclusive concern of the Management Accountant of the top management group.

The audience which participated with questions and opinions in the discussion showed a vivid interest in the exposition of Management Accounting and followed the proceedings, which lasted two hours, with tense attention.

The panel presentation succeeded in bringing the ramifications of the subject close to the members of the Society, which, in its educational work will have to tackle the task of preparing its senior members for the duties and responsibilities of management accountancy, the ultimate goal of the accountant in industry.

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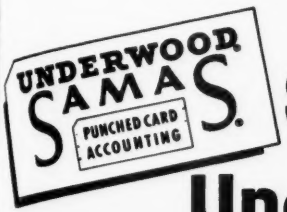

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C & M Round-Up . . .

By N. R. Barfoot, R.I.A.

Why Do Executives Change Their Jobs?

A recent study of the causes for executive job turnover reveals some interesting facts. Perhaps it will assist you to keep your management team on the job.

Executives are being added and lost at a 50% faster rate today than pre war. Losses due to death and retirement remain steady.

General post war expansion is the general cause of increased turnover since there are greater opportunities available. Business expansion provides the opportunity to move. It does not explain why.

Some 422 executives were interviewed to find out the why. This included presidents to department heads and all branches of management. Here are the results:

Reason	Number	Percent
Bigger job, more responsibility	126	29.9
Greater opportunity for future growth	91	21.6
Increased income	75	17.8
Not in accord with company policies	68	16.1
Separation at company initiative	62	14.7
Need change of activity	46	10.9
All other reasons	215	50.9

In 85% of the cases, men left of their own accord. Reasons given showed no difference in large and small companies, durable and non-durable goods industries.

Vice-presidents and presidents gave policy disagreement as the major reason. Company growth and desire for more responsibility were second and third reasons.

Department heads and assistants mostly desired a move to a bigger job. Future growth and increased income were second and third important points.

Financial men left chiefly because of policy disagreements. Manufacturing executives were mostly concerned about more income. Engineering and research personnel found a change in activity the most important reason for changing. Sales managers, as to be expected, gave long-term growth as the number one reason to seek another job.

Mortgage Money

The changes planned in the National Housing Act by the federal government will be of interest to financial institutions and the average purchaser of new houses.

A system of residential mortgage insurance is planned. Chartered banks as well as other financial houses will be able to lend on insured home mortgages.

In return for an appropriate insurance premium, C.M.H.C. will be empowered to establish a system of insuring holders of new residential mortgages against loss.

With this system in force, the lending function of C.M.H.C. will be discontinued.

The increase in construction costs since the limit of $10,000. was put on NHA loans may result in higher loan limits being set by government act.

An increase in the proportion of loan to lending value in order to make possible a smaller down payment is also under discussion.

Guaranteed Annual Wage

Whatever you may think of this plan for hourly rated workers it is the next big target of the steel and auto workers' unions. Here are the two current views on the subject:

Labour unions claim that:

—Workers should be paid on an annual basis the same as management.
—Social costs of enforced idleness should either be eliminated or borne by the community as a whole.
—Guaranteed annual wage will provide incentive to management to even out production.
—Guaranteed annual wage will mean greater security to workers with resultant increase in production.
—Labour turnover will decrease with guaranteed annual wage.

Management claims that:

—The idea is impractical in that fluctuation in production is usually the result of outside factors over which management has no control.
—It would mean paying idle employees at some periods which might mean financial ruin for some companies.
—Guaranteed annual wage would restrict management in planning expansion and in hiring extra staff to take care of peak periods.
—It would entail additional costs harmful to both unions and management.

Dominion Bureau of Statistics

What do you get out of the Dominion Bureau of Statistics? In any case, you as a businessman send in 3.7 million forms per year. These are put together by the 1,200 employees of the D.B.S. and put out in the form of some 400 reports.

A great many of these reports are of general significance. They tell what is happening to the Canadian economy. Others are of more specific interest and summarize, usually monthly, inventories, production, and sales in various individual industries and lines of trade.

Most reports don't apply to the average business. A monthly summary of important figures on industrial groups, labour, exports, etc., is prepared. A shorter weekly supplement is also sent out.

D.B.S. does a number of things on request of businessmen, including material not published because of limited interest. It will put special data together, in which case if more than half a day is required, you may be asked to pay for the service.

Some of the uses you can make of D.B.S. figures are as follows:

Prices — Some manufacturers use wholesale price indexes for iron and steel and nonferrous metals in negotiating contracts for "heavy" industry products. Can link escalator clauses in price contracts to various indexes. Consumer price index widely used in labour contracts. Basis of analysis of price trends in many fields.

Wages, salaries, earnings — Freely used in cost accounting by some firms. Can compare earnings, hours of employees against own and other industries and areas. Gauge competitors' costs. Average hourly earnings used in escalator clauses in some business agreements as representative of changes in labour costs.

International trade — Imports, exports of thousands of items, monthly. Quantities and values. Among most important figures for over-all economy too.

Vital Statistics — Use births, marriages, monthly, by regions, cities to fix quotas, frame production programmes of children's clothing, toys, carriages, foods, furniture, appliances, etc. Points way to longer term markets, other industries.

Capital Expenditures — Intentions of businessmen and others to spend on machinery and equipment as well as construction are surveyed at beginning of each year. Available for individual industries in considerable detail. Amazingly accurate in over-all picture.

Employment — Important indicator of markets, available monthly by regions. Unemployment figures give labour supply situation across country. New monthly labour force survey reveals part-time as well as full unemployment. Helpful in locating new industries.

Agriculture — Crop forecasts help banks, elevators, others who must help farmers predict needs. Also indicate purchasing power of farm regions in future. Farm cash income quarterly report tells it after the fact. Important market for machinery, hardware, fencing, etc., as well as normal consumer goods.

Manufacturing — Monthly inventories, shipments, orders of many individual industries. Quarterly figures on others. Annual census of industry covers everybody. Enables manufacturers to compare own material, labour, power costs with others in industry.

Construction — Annual survey of what businessmen and others plan to spend in year ahead. Available for individual industries in considerable detail. Annual reports of actual construction afterwards. Also, monthly, how many houses started in each important urban centre. Employment, wages by regions, monthly. Indexes of building costs important to businessmen planning plants.

Current Articles of Interest . . .

A compilation of current articles available to members, on loan from the library of the Society.

ACCOUNTING

NOTES ON THE DEVELOPMENT OF THE ACCOUNTANCY PROFESSION (PART II), by J. E. Smyth — The Canadian Chartered Accountant — Dec. '53.

DEPRECIATION

CONVENTIONAL DEPRECIATION ALLOWANCES VERSUS REPLACEMENT COST, by Robert Eisner — The Controller — Nov. '53.

EDUCATION AND TRAINING

TRAIN EXECUTIVES WHILE THEY WORK, by Robert E. Sampson — Harvard Business Review — Nov.-Dec. '53.

EFFICIENCY

STUDYING A JOB — BY WORK SAMPLING, by J. L. Hudson Co. — Business Week — Dec. '53.

EXECUTIVE COMPENSATION

EXECUTIVE COMPENSATION: THE TAX GIMMICKS VS. INCENTIVES, by Arch Patton — Harvard Business Review — Nov.-Dec. '53.

TRENDS IN EXECUTIVE COMPENSATION, by Ray Hawes — The Controller — Nov. '53.

FINANCIAL CONTROL

FINANCIAL CONTROL IN LOCAL AUTHORITIES, by G. B. Esslemont — The Accountants' Magazine — Nov. '53.

HUMAN RELATIONS

HOW TO TALK TO FOREMEN — IF YOU DARE — Factory Management and Maintenance — Dec. '53.

INVENTORIES

TABULATING EQUIPMENT FOR BETTER INVENTORY CONTROL, by Robert D. Pash — Factory Management and Maintenance — Dec. '53.

LABOUR

THE ILO — THREAT OR OPPORTUNITY? by George P. Delaney — Harvard Business Review — Nov.-Dec. '53.

MANAGEMENT

AN ANNOTATED BIBLIOGRAPHY — MANAGEMENT CONTROLS, by Henry C. Thole — Dec. '53.

MANAGEMENT ACCOUNTING

MANAGEMENT ACCOUNTING, by Ian T. Morrow — The Accountants' Magazine — Nov. '53.

MECHANICAL EQUIPMENT

AUTOMATION — THE NEW TECHNOLOGY, by John Diebold — Harvard Business Review — Nov.-Dec. '53.

MUNICIPAL

FINANCIAL CONTROL IN LOCAL AUTHORITIES, by G. B. Esslemont — The Accountants' Magazine — Nov. '53.

OVERHEAD

ABSORPTION AND DISTRIBUTION OF OVERHEADS, by S. G. Pillar — Cost & Industrial Accounting Review — Oct.-Dec. '53.

PERSONNEL

WHAT EMPLOYEES WANT FROM THEIR WORK, by Robert Saltonstall — Harvard Business Review — Nov.-Dec. '53.

REAL ESTATE

UNRECORDED LIABILITIES IN REAL ESTATE AND OTHER TRANSACTIONS, by Andor Beretvas — The Controller — Nov. '53.

REPORTS

THE OPERATIONS LETTER AS THE CONTROLLER'S MEDIUM OF EXPRESSION, by Paul L. Smith—The Controller — Nov. '53.

ADDRESS OF PUBLICATIONS

The Canadian Chartered Accountant, 10 Adelaide St. E., Toronto, Ont.
The Controller, 1 East 42nd St., New York 16, N.Y.
Harvard Business Review, Soldiers Field, Boston 63, Mass.
Business Week, 99-129 North Broadway, Albany, N.Y.
The Accountants' Magazine, 27 Queen St., Edinburgh 2, Scotland.
Factory Management & Maintenance, 330 West 42nd St., New York, N.Y.
Management Controls, W. E. Upjohn Institute, 709 South Westnedge Ave., Kalamazoo, Mich.
Cost and Industrial Accounting Review, Hope House, Gt. Peter St., London SW-1, England.

PERSONALS

Victor F. Davies, B.Com., R.I.A., has joined the firm of P. S. Ross and Sons, Montreal, as Manager of the Cost and Methods Department and will be associated with A. E. Bishop, C.A., the partner in charge of this department. Both Mr. Davies and Mr. Bishop are members of the Montreal Chapter of S.I.C.A.

W. J. Arnall, R.I.A., recently became affiliated with Canadian Freightways Limited, Calgary as Chief Accountant. Mr. Arnall was a member of the Regina Chapter before transferring to Calgary.

Computation of Production Requirements for Inventory Control . . .

By WALTER F. RENZ, M.B.A., C.P.A.,
Touche, Niven, Bailey & Smart,
Milwaukee, Wisconsin

In many manufacturing operations, the method of translating customers' orders from sales units into manufacturing units is essential to the effective determination of production requirements. This process is called "explosion". In this article, the author traces the development and operation of a highly flexible explosion process which incorporates peg-board equipment.

IN ALL inventory control situations, an element of the greatest importance is the proper determination of requirements for production. When customers' orders are to be shipped from stock, it includes the element of forecasting. In other cases it involves keeping in close contact with customers' orders. In the great majority of manufacturing operations effective determination of production requirements demands a satisfactory means of translating customers' orders from sales units into manufacturing units. This process is known as "explosion".

In many inventory control operations, the explosion process is of sufficient importance, that it can be said that inventory control problems begin and end here. There may be many methods of maintaining the actual inventory control records, but the necessity of a satisfactory method of computing requirements often eliminates many otherwise desirable alternatives from consideration. Methods of exploding sales units into manufacturing units range from laborious spread sheet techniques to the use of punched card equipment. The particular method to be adopted must always be viewed in the light of the particular set of circumstances involved. A procedure has recently been developed which has considerable application in both small and large businesses. It is sufficiently flexible to produce results in a complex situation, such as the one in which it was developed, but is, nevertheless, sufficiently inexpensive in equipment and operation to be available to smaller businesses. An explanation of the method centers on three phases:

1. The bills of material used for the explosion.
2. The method of computing requirements.
3. The summarizing of results.

Developing the Method of Computation

At this point, a brief description of the circumstances under which this method of computing requirements was developed is relevant. It was devised for a large manufacturer of gasoline engines. This company produces both standard engines and engines built to customers' specifications. The majority of engines fall into the latter category. Customers' specifications are variations of standard models and change the basic model through the addition of special parts or through the

deletion of standard parts. In nearly all cases one or more special parts are substituted for one or more similar parts on the basic engine. The number of changes on the standard engine varies with each specification and can involve more than 150 parts. The company has approximately 3,000 active customer specifications on file and is continually adding to this number. It is evident, therefore, that the problem of computing requirements for this company is considerably complex.

The inventory control method adopted by this company consists of a control ledger showing balances of stock not allocated to current production and balances on order. The ledger sheet for each part gives complete information with regard to that part. It identifies the part and shows its usage on various models. It shows a history of requirements over the period of time since the beginning of the system. It also shows quantities ordered and received together with the receiving schedule of quantities still on order. Requirements for production of the current month are posted to the ledger at the beginning of the month. This decreases the balance on hand at the beginning of the month, and when the balance falls below a certain minimum, a requisition for procurement of additional stock is prepared. The minimum balance is set at a point which will allow for orderly replenishment of stock and takes into consideration usage during the period of procurement. At the time the requisition is prepared, the material control clerk has before him all known requirements for ten months in advance. This enables him to order the correct quantity and to schedule the receipt of material at the proper time.

An analysis of the 3,000 specifications showed that maximum interchangeability of parts was obtained when the specifications were divided into seven basic model classifications. The number of parts on all specifications was well in excess of 7500 and many of these parts were interchangeable on all models. The maximum interchangeability, however, was found to be present when parts were segregated into the seven basic groups. Under this segregation it was also found that each list was of more manageable proportions.

In each of these basic groups, a list of parts is prepared which includes all parts which can be used on the specifications of the group. These lists are printed on peg-strips 2½ inches wide and 13 inches long. A colour code has been worked out for each of the seven groups in order that it can be readily ascertained which list is being used. The strips are punched so that a column one-half inch wide at the right of each strip is visible when put on the peg-bar. Each page of the part list contains approximately 65 part numbers. Each number is separated by a horizontal line from one edge of the strip to the other. The lists vary from ten to twenty pages in length. One year's requirement of each list is printed.

Bills of Material

An engineering bill of material is prepared for each customer's specification. This bill of material is arranged to facilitate manufacturing operations and, therefore, cannot be used for the explosion process. It is necessary first to prepare an explosion bill of material. The proper part list for the specification is selected, and the quantities shown on the engineering bill of the material are entered in the one-half inch space at the right opposite the parts affected. This constitutes the explosion bill of material and shows all the additional parts required and the standard parts not required to build one engine. It is used in conjunction with a similar bill of material for the standard engine to compute the requirements for the customer's order. The explosion bill of material differs from the engineering bill of material in form and the amount of explanatory material included. The change in form results from the need for a part sequence different from that of the engineering bill of material.

Each of the 3,000 or more specifications has an explosion bill of material on file. Each bill of material shows the changes to be made in the standard model, is in terms of a single engine, and contains both red and black quantities. The black quantities indicate additional parts required on the specification and the red quantities indicate standard engine parts omitted. As each new engineering bill of material is prepared, an explosion bill of material is also prepared and filed for future use. Any engineering changes are recorded on the bills of material, and they are always current. Once each year all specifications in each group are reviewed. Obsolete specifications are discarded, and the list of parts reviewed. If changes are sufficiently numerous, a revised part list is prepared and new bills of material for that group are made. This work is spread throughout the year during periods of decreased activity, but each group is reviewed annually.

Computation of Requirements

The actual computation of requirements begins with the receipt of the customer's order. An order may specify a number of engines to be delivered in a particular month, or it may be a blanket order against which a certain quantity of engines is to be delivered each month for several months. Any order with a delivery date in the next 10 months is processed immediately. A sales order which gives all particulars of the order is written, and the explosion process is set into motion.

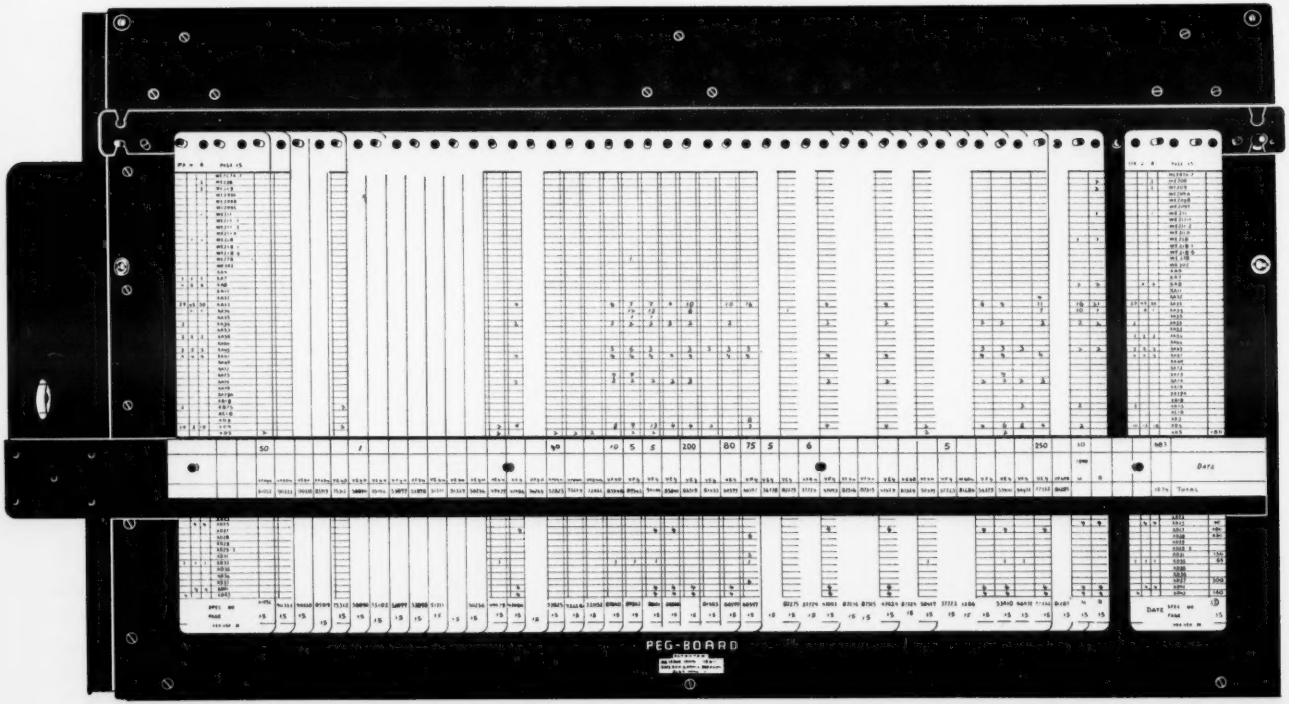
All orders are tabulated on an order sheet as an initial step. Since requirements are computed for a ten-month period, beginning with the current month, separate totals of requirements must be computed for each month in the period. The order sheet is, therefore, perforated into ten sections. Each section is punched so that after separation it can be attached to short dowels built into the ruler of a 36 inch peg-board. Each section is ruled vertically into one-half inch columns, and hori-

zontally one-half inch from both the top and bottom of the section. Each of these sections is labelled to designate a month in the requirement period. Each column is labelled with the number of the specification for which an order has been received. The quantity ordered is then entered at the top of the section corresponding to the month in which delivery is scheduled. Orders for identical specifications are combined into one total. When the order sheet is completed it shows a tabulation by specification and delivery date of all orders received within a given time.

The explosion bills of material for orders received are removed from the file and sorted according to page number. Like pages of the bills of material are grouped together in the sequence shown on the order sheet. Next they are set up on the peg-board so that the one-half inch column,containing the quantities to be used or eliminated, is visible. The pages are put on the peg-bar in layers so that the entire bill of material is on the bar when the pegging operation is completed. The sections of the order sheet are separated and the ten sections are placed on the pegs of the ruler, which is part of the board. Sets of part lists are attached to the bar at the right.

Each page on the peg-board, when set up for the explosion, is similar to a columnar sheet, showing the part number at the left and the requirements for the various specifications in columns to the right. Directly above on the ruler are the quantities of each specification ordered. The similarity to a columnar sheet ends in appearance, however. Since 3000 active specifications are on file, 3000 columns would be required on columnar sheets, and picking requirements from 3000 columns would be an extremely laborious task. Through the use of unit bills of material, only those bills of material for which orders were received currently need be handled, and the working area is confined to one column for each order, rather than 3000 columns.

The actual computation is done by placing the ruler on the bottom line of the page and extending requirements (figures on the peg-strips) by order quantities (figures on the ruler). Whenever a requirement quantity on the bill of material has an order quantity appearing directly above it on the ruler, an extension is made. Comptometers are used for making the extensions, and the extensions are accumulated in the machine until the last extension on the line has been made. Since the bills of material deal in both additions and deductions, and the order sheet shows both orders and cancellations, extensions resulting in deductions are made on half of the comptometer keyboard, and extensions resulting in additions are made on the other half of the comptometer keyboard. At the end of each line the operator computes the difference and records the result as an addition or deduction opposite the part number on the strip at the right. The ruler is then moved to the next line and requirements are computed for that part. A locking


PEG-BOARD

device holds the ruler securely in place while computations are being made. This process is repeated until requirements have been computed for all parts of the page.

It will be recalled that orders are scheduled by month of delivery for a ten-month period into the future and that it is necessary to compute requirements by months throughout the period for proper inventory control. Also, the order sheet is prepared in ten sections, each section showing orders for one month of the ten-month period. These sections were separated and attached, one over the other, to the ruler. When requirements for one month have been computed, the sheet on which the results have been recorded is labelled with the proper month, and both the results and the section of the order sheet are removed. This exposes on the ruler the section showing order quantities for the next month, and requirements are then computed for that month. This process is repeated until all requirements for the period have been computed. The completed page of each bill of material is then removed from the peg-bar, and the next page is exposed. The process is repeated for the parts shown on each page until a complete set of requirements has been developed.

Summarizing Results

The sheets on which the results have been written are set up on the peg-bar by page and month of requirements and fastened with transparent tape so that they can be removed from the bar. When this step has been completed, we have a part list showing requirements throughout the next ten months for each part on the list. In a smaller, less complex situation this would give the desired end result. Because the number of parts involved made it necessary to have more than one part list, it is necessary to summarize requirements for those parts which appear on more than one list. Although maximum interchangeability exists within specifications whose parts comprise a single part list, there is still a fair degree of interchangeability of parts throughout all engines. This summarization is accomplished by posting all requirements to a simple card file which contains one card for each part number. The part number is written on the card by use of an addressograph machine. The card contains a column for each month of the year and a sufficient number of lines to accommodate posting from the maximum number of lists on which the part could appear. The cumulative total from the previous explosion is entered, and after the requirements derived from the current explosion have been entered, a new cumulative total for each month is computed.

All requirements for the current month are immediately deducted from the available balance shown in the material ledger, and the remaining requirements are used by the material control clerks to assist in requisitioning and in scheduling future deliveries. These balances for future months are carried in this way until the month becomes

current, and during the first week of the month the total requirements are then deducted from available balances.

All cancellations and rescheduling of orders are subject to the same processing as new orders. At the beginning of each month the requirements for standard parts are added to the total requirements. The requirements of standard parts are computed in the same manner as the changes required on each specification.

Orders are processed weekly, but to provide a uniform work load throughout the week, the processing of orders has been scheduled to take place during the entire week, rather than after a specific closing date. Each of the basic groups is processed on a designated day, and in each group all orders which have been received since the processing day of the previous week are included. The closing date each week merely designates the day on which results were summarized. In this manner it is possible to maintain a uniform work load throughout the week and yet have results available in a timely manner. By careful scheduling of the processing day of any critical basic group, it is possible to have results on the group within a day or two after the closing date. Peak work loads and the personnel required to handle them are eliminated by this processing cycle.

This is one of several explosion methods. Whatever method a company uses, it must be carefully planned to meet the needs of the individual situation. Here is a method which has a maximum degree of flexibility. It can be adapted to the needs of the small business and can be easily expanded throughout the range of size to the large business. The investment in equipment is at a minimum, and a minimum amount of training and technical skill is required for its operation. In situations where these factors are of importance it merits careful consideration as a solution to the explosion problem.

TENTH INTERNATIONAL CONGRESS C.I.O.S. IN SAO PAULO

The Tenth International Congress of the International Committee for Scientific Management will be held in Sao Paulo, Brazil, February 19th to 24th. With the Brazilian Institute of Management as host, the Conference will take place during the 4th Centennial of the city.

Subjects such as "Policy Determination, Direction and Control of Marketing", "Controls of Top Management Use" and "Top Management's Responsibilities Towards Modern Managerial Techniques" will be discussed. Eight topics in all will be discussed at panel sessions during the six-day congress.

Another Look at Direct Costing . . .

By Norton M. Bedford, M.B.A., Ph.D., C.P.A.,
Associate Professor of Accounting,
Washington University, St. Louis, Missouri

To what extent is direct costing practicable? An answer to this question is provided by the author through a discussion of the nature of direct costs, the functions of product valuation, the uses of direct and full costing, and the problem of normal capacity.

THE topic of direct costing of inventories has received such a considerable amount of attention in recent years that it now seems time to stand off and take a rather broad look at this rather unorthodox development in the cost accounting field. Such is the objective of this paper. The information presented has been verified by a survey of executives of several different firms. While there was not complete agreement on all parts, there was such a preponderance in support of the views here expressed that the paper appears justified.

The general problem involved is whether or not the relatively fixed costs of manufacturing should be treated as a cost of the product. Stated another way, it is the problem of what to do with those costs of assets which expire whether or not production takes place. It is therefore, to a large degree, a problem which has arisen as industrialization has replaced labour as a productive factor and can be expected to be intensified as mechanization continues. As a growing problem it means that cost accounting must adapt itself to the changing economic conditions, for in the long run it is to be expected that the direct costs will represent a smaller and smaller proportion of total costs.

In support for the position that fixed costs of manufacturing should be treated as period costs, similar to distribution and administration expenses, it has been pointed out that the inventory procedure gives an unrealistic valuation of inventories and tends to be misunderstood by management, especially when used in conjunction with a standard cost system. This is so because a product produced in a period of low activity may be assigned a larger share of the fixed costs than a product produced in a period of high activity. Using a standard cost system does not overcome the problem, since either under-or-over-absorbed costs, depending upon the rate of production, may be charged against sales with the result that reported operating income may not be meaningful to management.

Using these inadequacies as a springboard, advocates of direct costing have noted that direct costing will give a consistent cost to units produced and when used with a standard cost system reduces under-or-over-absorbed costs to a minimum. Going further, it is then held that since it is the direct costs of production for which operative manage-

ment is largely responsible, control is more realistic if only the items controllable by operative management are held out for critical examination.

The full development of the theory of direct costing seemingly leads to the contribution theory approach to cost accounting, which is used rather extensively in department store accounting, and it is to be expected that before long someone will come forth with an article in some detail on the use of this theory in manufacturing when direct costing is used.

Nature of the Problem

It may be noted that the development of the theory of direct costing is considerably at variance with the budding and continuing theory of a few years back that distribution and administration costs, as well as factory costs, should be included as an inventory cost. The failure thus far to adopt this all-inclusive costing completely can be attributed more to the difficulty of a practical implementation of the concept than to a rejection of the underlying idea. As a matter of observation, it seems that the all-inclusive concept received considerable support as a theoretical ideal. Therefore, it appears that if the direct costing theory is to be established, it must be capable of being implemented in practice as well as having theoretical support.

In theoretical support for direct costs is the economic concept of marginal costs. Economists have long insisted that the marginal cost of a product is the addition to total costs necessary to produce and distribute the product. However, it is well to understand the exact meaning of this view, for the additional costs required to provide a product may not necessarily be the cost of the product. This can best be explained by a greatly simplified illustration. Assume a firm with fixed costs of $1,000 is operating at 80% of ideal capacity and producing 800 units with a variable cost of $2.00 per unit. Conventionally, the cost of these 800 units might be $2,600 ($1,600 plus $1,000) if normal capacity were considered to be 80% of ideal capacity. However, it should be noted that the fixed costs of $1,000 is a composition of two elements; used and unused capacity of $800 (80%) and $200 (20%), respectively. Thus, it might be maintained that the $2,600 of cost may be attributed in part to the production for the period ($2,400) and in part to the unused capacity ($200). Assume now that the firm increases production to 900 units or 90% of capacity. The additional cost of the 100 additional units would be the $200 at variable costs. But such an amount is not necessarily the cost of the additional 100 units, for by producing them a part of the unused capacity is used and the cost of this, in the amount of $100, is thus a cost of the 100 additional units. Of course, by this procedure, the unused capacity loss is reduced by $100 so that the net result of the $300 ($200 plus $100) of cost of the

additional units produced is to increase total cost by only $200. But to say that $200 is the cost of the additional units is not necessarily correct.

On a theoretical plane, it is possible to reduce the concept of marginal cost to a point where it cannot be held to be a measure of direct costs. Assume a firm enters into a contract for materials on an annual basis with an equal amount of materials to be supplied daily and that such materials are perishable in nature so that they must be used daily or will be lost, it is apparent that there is no change in total costs whether the firm produces or not and the marginal cost of production, so far as materials are concerned, is zero. But certainly most advocates of direct costing would hold that materials so used should be a direct cost of production. There are many other instances which might be cited to indicate that marginal costs and direct costs are not consistent ideas. A guarantee to purchase so much power each period of time or a guaranteed annual wage are typical examples.

However, it should not be construed that the foregoing theoretical analysis necessarily means that direct costing must find its theoretical support from a source other than the marginal cost theory. Rather, the foregoing represents certain limitations to the use of marginal cost as a theoretical basis for direct costing. In the main and on a practical basis, there seems to be considerable similarity between the two concepts. Therefore, if there is any theoretical support for marginal costs as a measure of the cost of a product, this same support may well be applied to the theory of direct costing. However, before entering into an overall examination of direct costing, it is appropriate to examine the nature of direct and indirect costs.

Nature of Direct Costs

Without stating so in explicit terms, the idea underlying most of the articles on direct costing has been that direct costs are the costs caused by the production of the product in the current period. As noted above, there are some limitations to this concept. Nevertheless, the investigation of the nature of direct costs must turn to the problem of determining which costs are caused by the production of the product in the period. Presumably, such costs must be all manufacturing costs of the period which might be avoided if the production were not undertaken. This view, too, has theoretical support in economic theory under the concept of "User" cost. This concept is involved but it does lend support to the view that the cost of a product should include only the costs caused by the production or, more accurately, the costs which could have been avoided or escaped if the units under consideration had not been produced. The practical implementation of the concept of "User" cost is questionable, but it may be held that direct costing is a reasonable approximation to it, and therefore, can be defended on the same grounds as the user cost concept.

It should not be assumed that direct costing is a clear cut concept easily capable of being implemented in practice. In the first place, it may not be the same as controllable costs, for at times, items controllable by operative management may not be charged as direct costs, and at other times items not controllable by operative management may be included as direct costs. Several indirect costs such as supplies, machine depreciation, and maintenance are often controllable to some degree by operative management and are not considered direct costs. Contrariwise, direct labour paid on an annual wage is ordinarily a direct cost but not controllable by operative management. Nor are the terms variable and direct costs the same, as the previous discussion of a long term contract for perishable materials indicates. Nevertheless, it must be agreed that direct costs are often not so far at variance with the concepts of variable and controllable costs that they cannot serve as a rough approximation to the latter two.

In summary, it seems that direct costs must represent those costs which can be traced directly to a product in the sense that it can be seen that the product benefits directly from these costs. It also appears that these costs represent a rough approximation of various other concepts of cost for which there is some theoretical support.

Functions of Product Valuation

To the layman the process of product valuation must be a fascinating procedure. To him the finished product is composed of certain direct materials which can be observed to be a part of the finished product and when the accountant implies that the finished product is a composition of labour, materials, power and a hundred other types of goods and services, accounting becomes difficult to understand. In view of this type of thinking, one is inclined to wonder why a business firm does not reason similarly and assign to the finished product only the cost of the raw materials which are a part of the finished product. Without entering into a lengthy discussion of this point, it appears that the reason for including costs in addition to raw materials is that value has in some sense been added to the finished product by using labour and other goods and services in making it. That is, the firm includes these costs because it is concerned with value whereas the layman excludes them because he is interested in content rather than value. Thus the layman asks, "What is this made of?", while the businessman asks, "What is this worth?", or "What does this cost?"

The foregoing rather crude example bluntly indicates that the cost content of a product depends upon the purpose for which the information is to be used. It follows that since business firms use product valuation for different purposes the cost of content of a product should vary according to the use to which the information is to be put. Presumably the question of whether products should be full or direct costed rests upon the function of product valuation. There are several

possible functions which might be performed by product valuation but these may be grouped, for cost accounting purposes, under two headings; long-range and short-run managerial decisions. Decisions such as price setting, adding or dropping territories or products, operating efficiency control or changes all have both a long-range and a short-run aspect. In the main the short-run decisions require information on the direct costs of production while long-range decisions are generally made on the basis of full costs.

Uses of Direct Costing

Assuming that direct costs are a fair representation of the variable, marginal, and user costs, an assumption subject to some limitations as the earlier discussion indicated, it is possible to itemize several decisions which properly should be made on the basis of direct costs. As a limiting point below which price should not be cut, direct costs are much more informative than full costs. However, care should be exercised to make certain that management does not expand productive facilities when pricing at this minimum amount, for the result might well be to cover direct costs and never cover fixed costs. Therefore, it seems that direct costs are useful as a price setting tool only when the firm has unused capacity. If it is necessary to expand capacity, direct costs are not significant for pricing purposes. Similarly, it is to direct costs that management must turn for information on the desirability of dropping a product or territory. The question of whether to add a new product or territory may rest upon direct costs if there is unused capacity in the plant but must be related to full costs if additional capacity must be added.

In the area of control, direct costs have the advantage of being definitely assignable as a responsibility of operative management. Operative management is in no position to explain either favorable or unfavorable results on the grounds that certain costs are beyond their control. On the other hand, if control of operative management were exercised only by means of direct costs, it is possible that waste of the so-called non-controllable costs might result. This might take the form of requesting new machinery or using machinery for tasks that might be more efficiently performed by labour. It may be noted that the theoretical objection to the effect that operative management should not have control over such decisions was not fully supported by the survey upon which this paper is based.

Uses of Full Costing

The determination of income is one of the central problems of accounting and one of the uses of inventory valuation is to aid in measuring income. Without entering into the difficult task of defining income, it seems possible to obtain some agreement to the proposal that the concept of income has some relation to the concept of value. From

this basis, it may be maintained that inventories should therefore include the cost of all goods or services which have added values to the product. This seems to call for the full costing procedure for it is difficult to justify omitting the cost of certain goods and services when there is observable evidence that such items have added values to the product. To hold that depreciation on a new machine replacing direct labour costs should be excluded from the valuation of the product when the direct labour was formerly included is inconsistent with the view that the values in the product might be provided by either machinery or labour. Clearly, the values have been added by both. Further, as industry becomes more and more mechanized with resulting decreases in direct costs, inventory valuations on a direct costing basis might be more confusing to management than is said now to be the situation with full costing.

Coming to the problem of long-range price setting, it seems too evident to elaborate that in the long run the firm must cover full costs or it will go out of business. Price setting in its more basic form must be made high enough to cover all costs. This is especially true if the firm endeavors to maintain one price on products and a contrary attempt may well lead to legal action under the Robinson-Patman legislation. Still further, a firm would be unwisely advised to replace fixed facilities to produce a product or sell in a territory from which only direct costs are recovered. For purposes such as this full costing appears to better serve the purpose than does direct costing.

Conclusions

One advantage claimed for direct costing is that the accounting procedures are simplified. Undoubtedly the elimination of the problem of assigning indirect costs to product can reduce the accounting task of rendering reports. This is especially true, if the firm does not use a budget and would have to prepare special estimates for applying predetermined indirect costs.

On the other hand, there is much to support the view that accounting reports should be rendered in such a manner as to reveal the long-run results of the firm, for it is the long run to which the managerial efforts should generally be applied. Undoubtedly, many short-run expediencies should and must be adopted by management if the firm is to be most efficiently operated but, nevertheless, managerial policy and broad decisions must be based upon an understanding of the long-run results.

Possibly the most desirable procedure would be for full costing, including distribution and administration costs where possible, to be the basic objective of product costing with the understanding that supplementary reports be included as a basis for short-run decisions. However, it must be agreed that acceptance of this conclusion implies that some

solution must be found for the indeterminate nature of normal capacity, which is used for applying indirect costs to products.

Problem of Normal Capacity

It is a characteristic of durable facilities that they are seldom used to their full capacities. Machines are unused at night. Buildings and equipment are seldom used to their fullest potentialities at all times. It might seem therefore that the idle capacity loss of a firm would represent a very large portion of the depreciation taken on the basis of time. However, such is not the situation for the reason that the buyer of the durable equipment, knowing at the time the facilities were purchased that all of the services in these goods could not be used, pays a price for the equipment equal to the services which the firm expects to derive from the facilities. Thus it is that the cost of fixed facilities is more related to the services which the firm expects to extract from the facilities than to the total potential services in them. Accounting, being concerned with cost, is faced with the task of assigning the cost of the services to production and correctly holds that most of the cost should be assigned to product because the price of the equipment was for only the services expected to be used. The implication is that the services in these facilities which were expected to be unused had no cost attached to them. Essentially then, the accounting problem of assigning fixed costs to production is one of determining the amount of the services for which the price was paid and assigning all the cost of the fixed facilities on the basis of these services as they are used. The failure of buyers to specify exactly which services in the durable equipment were purchased led to the development of the concept of normal capacity. Normal capacity as thus conceived is a rather crude estimation of the services to be used. Under it the total cost of the fixed facilities is presumed to be used up at this normal capacity rate.

The essential difficulty which arises when the normal capacity concept is used as a basis for standard costs is that in recording actual indirect costs it is assumed that an equal amount of depreciation and other fixed costs should be recorded each period of time. In discussing several decisions of whether or not to invest in fixed facilities, it was quite apparent that it was not the assumption of the decision to buy that the services would be used an equal amount each period of time. Seasonal and annual variations were expected. Therefore, the accounting assumption that fixed costs are time costs is not warranted by the facts of the situation. The conclusion is that fixed indirect costs are not a constant amount each period of time or even that they are time costs. It is of course true that values may be lost from the fixed facilities on the basis of time, but it is not true that all values in fixed facilities were purchased and the values lost may well have no cost attached to them. Since accountants are concerned with cost, it is

evident that costs of long term facilities should not be an equal amount each period of time but rather should be assigned to production or to idle capacity loss on the basis of the services which were purchased and at the time such are used or lost. The adoption of this procedure would do much to eliminate the large over-or-under applied indirect costs which may arise when such items are applied on the basis of a standard cost developed from a normal capacity budget. This requires that the accountant has before him a statement from management regarding what was expected from the goods and services acquired at the time such items were acquired. This would also do much to eliminate the problem of deciding the meaning of normal capacity.

This somewhat unorthodox suggestion for handling fixed costs may not be the exact procedure which should be adopted by firms but it is certain that something must be done by cost accountants to meet the ever increasing problem of fixed costs if cost reports are to have meaning. The economy is changing rapidly toward more and more fixed costs and cost accounting must adapt itself to the changed environment. The rise of the theory of direct costing can be attributed more to objection to the conventional cost accounting approach, rather than to the basic philosophy of direct costs.

OBITUARY

Morrison A. Hewitt

It is with much regret that we announce the death of M. A. Hewitt on January 6, 1954.

The sudden death of Mr. Hewitt in his fifty-sixth year came as a great shock to members of the Ontario Society and his business associates at Burlington Steel Company Limited, Hamilton.

Mr. Hewitt, a member of the Hamilton Chapter served on the Directorate of this Chapter for many years. He was Director of Public Relations in 1950-51 and Assistant Secretary-Treasurer in 1952.

To Mrs. Hewitt we extend our deepest sympathy.

INVESTMENT PER WORKER IN CHEMICAL INDUSTRY

"Always relatively high in the Chemical industry, the amount of capital invested per worker has shot up rapidly in recent years," reports the *Chemical News*, journal of the Manufacturing Chemists Association.

An article in the December-January issue, states that in 1940 an average investment of $9,700 stood behind every chemical job in the U.S.A. In 1950, the average figure was $13,200.

Heavy initial cost for specialized equipment in some of the new, nearly automatic plants boost capital requirements as high as $100,000 per operating employee.

Office Wage Administration . . .

By A. M. MACKENZIE, B.A.Sc.,
Assistant Vice-President, Labour Relations, Bell Telephone Company of Canada

In exploring various phases of office wage administration, the author outlines the policies and practices in effect at the Bell Telephone Company to illustrate his discussion, and suggests some very valuable guide rules for an intelligent and systematic approach to wage administration problems.

THIS subject is not one which would ordinarily arouse a great deal of enthusiasm, since it may appear to have a somewhat ordinary and commonplace significance in a world of electronic computers, microwave relay systems and other equally fascinating technical developments. However, it is reasonable to suggest that Management's main concern in running a business has shifted from technical and financial problems to problems of Labour Relations in the past ten years. In the Labour Relations field, the problems of "Wage Administration" are of paramount importance (*Business Week*, Aug. 15, 1953, p. 163). Therefore, this paper could quite easily bear the sub-title "Thinking of Office Wages" and a few of the phases of this subject will be explored in this vein.

The everyday professional activities of cost accountants involve the relatively exact science of cost accounting, with its standard costs, analysis of variances, cost relationships and other equally impressive terms. In dealing with wages, this approach to exactitude is nonexistant for wages deal with that highly unpredictable element, the human being, with all his foibles and inconsistencies.

The relation between management and employees in the administration of wages is not a simple one-way relation, as it appears to have been 50 years ago, but rather, a complex process of interrelations. A chemist would say that the arrows in the equation go both ways indicating action and reaction. These reactions affect many phases of employee-management relations. To mention only a few, there are morale, productivity, health, profits and reputation.

What Are Wages?

In Adam Smith's "The Wealth of Nations", which was written nearly 200 years ago, he points out that "The produce of labour constitutes the natural recompense or wages of labour". In that original state of things, the whole produce of labour belongs to the labourer. But that original state of things really never existed, for as soon as "land ownership" and "accumulation of stock" were introduced into the economy, the servant and master relationship came into being. And to quote again from "The Wealth of Nations":

"What are the common wages of labour, depends everywhere upon the contract made between these two parties, whose interests, are by no means the same. The workmen desire to get as much, the masters to give as little as possible. The former are disposed to combine in order to raise wages, the latter are disposed to combine to lower the wages of labour."

This definition reduced to its simplest form becomes:

"Wages are payment for services rendered."

This concept of wages recognizes that basically, wages are integral with the accomplishments of the people in a company, that wages should be proportionate to the workers' contribution to the enterprise.

A young lady's looks, grooming, dress, cultural attainments, etc., may contribute to an office manager's desire to hire her, but the essential consideration is that wages are paid for the work which that young lady can do. Therefore, a logical conclusion would be that:

"In office wage administration today, there is no room for the drone, the misfit, the favourite, the incompetent. Every office worker must meet a minimum standard of attainment if we would have a harmonious, effective work group."

How Important Are Wages to Employees?

Authorities are not unanimous in the answer to this question as in fact they are not unanimous on many questions in the wages field.

Prof. Richard A. Lester of Princeton, at a Seminar at the University of Montreal a few years ago, suggested that employed workers are tied to a firm by associations, seniority, inertia, etc., so do not, in general, go shopping around for a new job which will pay higher wages. Prof. Lester suggested that wages are only a part of the total bundle which develops worker satisfaction.

A somewhat contrary view is expressed in the April 1953 issue of *Harvard Business Review* in which the writer, Kenneth Thompson, quotes several authorities, "that wages are not uppermost in the minds of workers", and then proceeds to explode the myth. He says:

"Only when the wage question is resolved satisfactorily, do the many factors which are more important to employees than wages come into effect. Wages are still the central issue in Labour Relations."

What Is a Fair Wage?

In the aforementioned *Harvard Business Review,* it is suggested that:

"A Fair Wage is the wage an employer has to pay to achieve willing employee performance."

The terms Fair Wage, Proper Wage, Adequate Wage, Moral Wage, Decent Wage and many others have been used synonomously, but in

all cases the terms are relative, not absolute. The definition of a fair wage probably depends on whether it is being given or received.

However, many Union and Management authorities firmly believe that no other method of Wage Determination would come closer to a fair wage than collective bargaining. The rejection of such alternatives as government wage control and arbitration leaves only the admittedly imperfect process of collective bargaining as a workable method of wage determination.

> In this connection Professor Sumner H. Slichter of Harvard says: "If Collective Bargaining is to command respect, it must be an attempt to determine what is fair."

The Human Element In Wage Administration

Probably in no other field of management is the human element as important as it is in the field of wage administration.

In the September 1953 issue of *Fortune*, there is an article by the dynamic president of International Harvester, John L. McCaffrey, entitled "What Corporation Presidents Think About at Night". After observing that problems of finance, production, sales or engineering can be pretty well taken care of during regular business hours, he says:

> "There are other problems, however, that a Corporation President has to sweat and struggle with, largely by himself. They are the problems he thinks about at night. They all arise out of one simple fact. I can sum up this situation in one sentence — the biggest trouble with industry is that it is full of human beings."

In this article, Mr. McCaffrey also says:

> "A drop hammer never gets jealous of other drop hammers, a drill press never sulks — but the same cannot be said of people."

There is no other phase of human experience in which people are so subjective as they are in regard to their wages. At this point the caption of a recent cartoon in which a male employee has stomped into the boss's office and complained of his wages is quite appropriate. The boss is represented as saying:

> "I admit we do not pay you what you're worth, Ledby — but we musn't violate the Minimum Wage Law you know."

Importance of Uniformity in Wage Administration

It is of great importance for management to develop in the minds of employees the conviction that management is not playing favourites either as regards individual employees or groups of employees, especially insofar as wages are concerned.

In a recent booklet entitled *Men and Unions*, the reasons why employees want unions are analyzed based on a cross-section survey of

2,000 workers in 15 American cities and the following conclusion is presented:

> "The correction of *wage inequities* is more important to employees than across-the-board wage increases. An employee compares his own wages with what he thinks other people in his own plant, doing much the same kind of job are making."

In developing and maintaining an efficient and contented employee body, it is important that management make every effort to avoid having employees feel that they are the subjects of discrimination, especially in respect to wages. Management should be constantly conscious, therefore, of the positive merit of uniformity in wage matters.

Discrimination, either real or imaginary, can cause management more grief than any other wage problem. How can discrimination be avoided? Three basic rules are suggested:

1. Have a clearly worded Wage Policy, implemented by clearly written practices covering all major phases of wage administration.
2. Educate supervisory personnel in the underlying philosophy and the details of the wage administration practices.
3. Inform the employee body.

In a small, one-location organization, it would appear relatively easy to follow these three rules, but as organizations grow and spread, the problem becomes much more complex. In the Bell, for example, there are 6,000 clerical employees located in 117 different localities ranging in size from the cities of Toronto and Montreal to towns of the size of Farnham and Perth and are employed in ten different departments, each of which has a large measure of departmental autonomy.

Wage Determination

The processes of wage determination are neither standard nor static. They must be adapted to the situation in hand, and it is unlikely that the procedures used in one situation will be completely applicable in any other situation. Therefore a generalization will not be attempted. Many volumes have been written on wage determination, but as an illustration of some of the considerations which may be involved, a brief outline of the specific clerical wage determination procedures which have been found satisfactory in the Bell Telephone Company may be enlightening.

(a) *Wage Policy*

In the Bell Telephone Company it has been found advisable to adopt a wage policy which is fair and equitable to employees, the Company and the Public. This policy is:

> *To pay wages which are in good relationship with those being paid in like communities for work requiring similar skill, effort and responsibility and performed under comparable working conditions.*

This policy recognizes that on a broad social equity basis, the community wage level provides a fair and equitable basis for wage determination.

(b) *Wage Surveys*

The implementation of the Company wage policy requires that management make comparisons with community wage levels and this necessitates the taking of a wage survey. This is a fact finding project which is carried out periodically by Company Staff personnel on a confidential basis to determine the current wage levels in the larger localities in which the company operates. The "interview" method is used in the survey.

The survey consists of two main parts which are carried out concurrently viz. the female clerical wage survey and the male craft wage survey. Since this paper is concerned only with clerical wage matters, the discussion will be confined to that phase of the survey. The 1953 clerical survey was carried out in a total of 75 localities varying in size from the cities of Montreal and Toronto to towns such as Granby, Perth and Sorel.

It is important that wage information be collected from a sufficiently large number of firms in a community to insure that it does reflect the community wage level. For example, in the 1953 survey, clerical wage data were collected from over 100 firms in each of Montreal and Toronto and the number of clerical employees covered by the wage data obtained aggregated over 30,000.

It has already been indicated that the survey is carried out by the "interview" method in which field interviewers visit the firms in a locality on an appointment basis. During the interview with a designated responsible representative of the firm, the job definitions of 32 typical female clerical jobs are reviewed and for any of the jobs which exist in the firm, the top rate in effect and the existing wage rates for all employees in the job are recorded by the interviewer on the prescribed forms. These 32 typical clerical jobs range from such junior jobs as messenger and file clerk to the more highly skilled jobs such as secretary and payroll clerk.

(c) *Job Evaluation*

A Plan of Clerical Job Evaluation was adopted by the Bell Telephone Company in 1946 as a means for determining *wage relationships* among non-management office occupations. This plan was designed specifically to cover clerical and related occupations in the telephone industry.

Job Evaluation is a method of establishing, in a systematic manner, the relative values of jobs in a job family (such as the clerical family of jobs). It should be stressed that Job Evaluation rates *jobs* and *not employees.*

Job Evaluation is essentially based on the judgment of those charged with its development and administration and, therefore, no claims are made that it is mathematically exact. On the other hand, the Job Evaluation is an expensive project both in the installation stage and the continuing administration phase.

In the development phase of the Clerical Job Evaluation project, it was decided to adopt a plan using defined degrees and associated point values for each of ten job factors. Each clerical job is rated for each of the ten job factors and assigned a number of points on each factor. The sum of the points, thus assigned, constitutes the Rating of the job. The range of point ratings of the clerical jobs in our Company is from 25 points for jobs such as "Office Junior" to 335 points for senior clerical jobs. Thus, all clerical jobs, regardless of department, are arranged in relative value, ranging from the least difficult to the most difficult. This brief description of the Clerical Job Evaluation Plan has only been included to provide a basis for discussing the relationship between Job Evaluation and Office Wage Determination.

(d) *Grading of Clerical Jobs for Wage Purposes*

There are some 700 different clerical jobs in the Bell Telephone Company, each one of which has been rated and assigned a point rating. In theory the point rating of a job could constitute the direct basis for determining the wage rate of the job, but if this were done, there would be many different wage rates. Practical considerations, therefore, require that jobs be grouped together into grades according to point ratings for common wage treatment. The Bell uses nine clerical grades, each of which includes all jobs within a band of 38 points. (First one 44 points).

(e) *Analysis of Market Rates Paid to the Various Grades*

One of the problems in using wage survey data is the making of comparisons between company rates and the market rates in the community. Job Evaluation provides a facility for comparing clerical wage levels in the Company with clerical wage levels in the community at large.

This is accomplished by rating the 32 wage survey jobs under the Clerical Job Evaluation Plan and using this range of point values and the market wage data to develop a "Market Line of Best Fit". This Line of Best Fit is a straight line showing the average relationship between the clerical wage rates in the community and the job evaluation points for the 32 survey jobs.

It is also possible to plot the wage rates paid for the 9 clerical grades against the job evaluation mid-point values of the 9 grades and this gives a straight line graph on the same basis as the Market Line of Best Fit.

A comparison of the Bell Company line with the market line shows the existing relationship over the whole range of jobs and provides a

factual guide to management judgment in determining what, if any, adjustment in wages appears to be required in keeping with our wage policy.

(f) *Wage Schedule Structure*

In any industry having a large proportion of specialized clerical operations, it is necessary to hire inexperienced employees, having the required mental development, and to set up training facilities, either on-the-job or off-the-job (or a combination of the two) to develop and train these inexperienced people. In effect, this results in incorporating a considerable apprenticeship group into the clerical work force. In addition, it is also general practice to make promotions within the clerical group from the lower grade to the higher grade jobs, thus avoiding stagnation on the lower graded jobs and, at the same time, capitalizing on the experience gained by an employee on the lower graded jobs.

In designing a wage schedule to cover a range of grades, it is desirable, therefore, to provide for both progression and promotional wage increases.

(g) *Fringe Benefits*

A phase of wage administration which is receiving an increasing amount of attention in the last few years is the so-called "Fringe Benefits" which are frequently referred to as "the hidden payroll" or "non-wage labour costs". A review of studies which have been carried out, mostly in the United States, indicates that there is a considerable variation in the scope of items which are considered as constituting fringe benefits.

A Fringe Benefit Study which the Company made for the year 1952, on a somewhat conservative basis, included such items as Pension Fund Costs, Paid Sickness Absence, Vacation Payments, etc., and indicated that the fringe benefit costs amounted to 22% of payroll and averaged $618 per employee per year. These figures are quite comparable to figures developed or several hundred firms in the United States.

These fringe benefits whether they consist of time or money, do substantially increase both the well-being of employees and the cost of operations. It is significant to note that some labour unions are showing a tendency to bargain for fringe benefits as an alternative to wage increases and management people should be alert to their importance as an operating cost.

(h) *Agreement with the Union*

For unionized employees, the final determination of wage rates is, of course, the result of collective bargaining between management and union representatives. It is essential, therefore, that in preparation for collective bargaining sessions, the wage survey data and other significant criteria be analyzed and organized in such a way that manage-

ment can come to a supportable conclusion as to the wage area in which negotiations can be conducted.

Administrative Practices

(a) *Progession Increases*

The necessity of hiring inexperienced employees into the clerical work force and training these employees at company expense, has been discussed. This necessitates the setting of starting rates which will be adequate to attract new employees with the required qualifications to start as inexperienced beginners.

Having hired these new employees, it is, in the opinion of the Bell, desirable to grant progression increases at fairly frequent intervals, i.e. at 6 or 9 month intervals, to those employees whose progress and performance are satisfactory. These progression increases are continued until the employee reaches the maximum wage rate for the job. In the lowest clerical grade, the length of the schedule from starting rate to maximum rate is 2 years and in our higher clerical grades the length of schedule is 7 years.

(b) *Promotional Increases*

A promotion to a job in a higher grade should always be accompanied by a promotional wage increase, and the amount of the promotional increase should not differ greatly from the regular progression increases. This requires that wage schedules be so constructed that a promoted employee can be granted progression increases after promotion on a basis that will not discriminate against employees who have always been in the higher grade.

(c) *Human Relations in Wage Administration*

A phase of personnel work which is being given increasing attention in recent years is the so-called field of Human Relations. Whatever the reasons for this emphasis on the employee as an individual (increasing unionization, higher labour costs or just simply a better understanding of personnel needs) the fact is that many managements have, in recent years, moved from an attitude of indifference toward the individual to an attitude of deep concern with the development of policies and practices which will gain employee approval and goodwill.

One of the important phases of Human Relations is Communication between Management and Employees, involving both the upward and downward flow of information in the organization and this is particularly true in the field of wage administration. In this connection, the statement of Dr. L. E. Himler, Asst. Professor of Mental Health, University of Michigan in a talk before the Detroit Chapter of N.O.M.A. a few years ago is significant. Dr. Himler said:

> "One of the ways to discourage an employee, of course, is never to discuss wages. He either gets discouraged and quits or keeps bringing the subject up, getting more frustrated and inefficient each time. My own feeling is that an employer

> ought to talk wages to every important employee at least once every six months."

The importance of having an informed employee body as a means of avoiding grievances on wage matters has already been covered. It is not difficult to devise means of disseminating information on wage matters down the line of organization to suit the size and complexity of the organization, but the value of such information will be greatly influenced by the ability of management personnel to talk these matters over with their employees and clear up misunderstandings as they arise. Therefore, it appears to be of the utmost importance that management personnel have a knowledge of the underlying philosophy of our wage policies and that they have some skill in discussing them with employees.

The problem of developing and maintaining a free flow of information up the line of organization is somewhat more complex than the downward flow of information, and probably the chief impetus to this upward flow of ideas and information has been the improved training of supervisors in leadership and human relations. Basically, of course, the first requirement must be that employees know that management is willing and anxious to hear from them. One company, in a statement to all employees, put it this way:

> "If we do not know about your problems, we cannot help you. We want to know about them, whether they concern your wages, your work, a possible transfer or a suggestion relative to your work."

This expressed interest of management in the individual must be accompanied by the immediate supervisor making apparent to those employees, under his control, that he really wants to obtain information from them, really wants to talk over their problem with them, and is not afraid of hearing unpleasant news. This same attitude must be developed at each successively higher level of management so that the policy making level of management may get a reasonably accurate picture of employee attitudes as reflected in day-to-day operations.

It is the recognized view of the Bell Telephone Company that the upward and downward flow of information in an organization are complementary, in other words, that the effectiveness of downward communication depends to a considerable extent on a real knowledge of employee attitudes and interests. In wage administration matters, therefore, it is equally important for management to understand the employee viewpoint and for employees to understand management's viewpoint. In an effort to accomplish these objectives, a continuous programme of Supervisory Training is carried on, and in recent years, extensive training of supervisory personnel in Human Relations has been done.

(d) *Unionization of Office Employees*

Existing Canadian legislation gives non-supervisory employees the right to bargain collectively with their employers for wages and other working conditions and makes it mandatory for the employers to bargain collectively if the employees become certified. Traditionally, labour unions have been composed largely of wage earners in the crafts and manufacturing industries but there is some tendency today for white collar employees to form unions as evidenced by the existence of unions comprising civil service employees, school teachers, and office employees.

The extent of unionization of office workers in Canada is not definitely known, but some indication in this respect is given in a recent Department of Labour study (*Labour Gazette*, January 1953). This study indicates that in October 1951, almost 10 per cent of white collar workers in Canadian manufacturing industries were unionized. While this percentage is small in comparison with the almost 50 per cent unionization of plant workers in manufacturing, it represents a substantial advance in the last decade.

This trend toward unionization of office employees in industry today is one with which management has to cope, and in some cases, at least, it will force an overhauling of some of the time-tested methods of administering office wages. It is not intended, here, to give the impression that unionization of office employees is something to be feared or that it must of necessity develop hostility between management and employees. After several years of experience with a clerical union at The Bell, it can be said that a well organized and intelligently led union can be a real ally of management in running the business. Some of the possible advantages of a union from management's viewpoint might be stated as follows:

1. It gives management a definite and recognized point of contact with the employee body.
2. It develops in the employee body at large a greater knowledge of the business and how it is run.
3. It eliminates the individual employee's sense of fear of intimidation where it existed.

Conclusion

It was suggested at the outset of this paper that the objective of this paper would be to explore some of the phases of Office Wage Administration. As illustrations, the views, practices and policies of the Bell Telephone Company have been presented and these references have been illustrative only. The problems of wage administration are both varied and complex, involving both economic and human considerations and it would indeed be presumptuous to contend that any one answer to a problem is absolute or final.

Student Section . . .

Comments by A. V. HARRIS, C.A., R.I.A.

FUNDAMENTALS OF COST ACCOUNTING — 1953 EXAMINATION

QUESTION I (25 marks)

The Senior Mfg. Co. operates 10 successive operations with each operation conducted in a separate department. With the following information you are asked to present a cost statement showing the total cost of Direct Materials, Direct Labour and Manufacturing Expense and the unit cost for each element of cost for each of the first five departments for the month of September.

Inventory: Sept. 1st

30 units completed in department 4, but not yet transferred —
Direct Material: $31.00; Direct Labour and Mfg. Expense: $26.00
40 units completed in department 8, but not yet transferred —
Direct Material: $110.00; Direct Labour and Mfg. Expense: $120.00
Units started in process during September — 3,000.
Costs for the month of September were as follows:

Direct Material:	Department 1	$6,000.00
	Department 6	500.00
	Department 9	200.00
Direct Labour:	Department 1	300.00
	Department 2	150.00
	Department 3	300.00
	Department 4	596.00
	Department 5	602.00
	Department 6	520.00
	Department 7	115.00
	Department 8	75.00
	Department 9	150.00
	Department 10	240.00

Manufacturing expenses $6,096.00 to be distributed on the basis of Direct Labour Costs for the month.

Inventory: Sept. 30th

20 units completed in department 3, but not yet transferred to department 4.
30 units completed in department 6, but not yet transferred to department 7.

On transferring inventory between departments, the company policy is to use the FIFO method.

See page 39 for Solution to Question I

QUESTION II (10 marks)

On what basis would you distribute the following factory service costs to departments:

Power
Taxes on factory
Superintendence
Fire Insurance on building
Rent of Factory
Factory-building depreciation
Repairs to machinery
Light expense
Cost accounting expense
Depreciation on machinery
General Factory supplies
Workmen's Compensation Insurance
Storeroom Expenses

SOLUTION TO QUESTION II:

Expense	Basis of Distribution	Alternates
Power	Horse Power Hours	Machine hours of production Horse power of machines Number of machines

(Continued on page 40)

Senior Manufacturing Company

Statement of Departmental Costs

Month of September 19....

	Op. 1		Op. 2		Op. 3		Op. 4		Op. 5	
Materials	$ 6,000	$2.00	—		—		—		—	
Labour	300	.10	$ 150	$ .05	$ 300	$ .10	$ 596	$ .20	$ 602	$ .20
Manufacturing Expense	600	.20	300	.10	600	.20	1,192	.40	1,204	.40
Cost in each Department	$ 6,900	$2.30	$ 450	$ .15	$ 900	$ .30	$ 1,788	$ .60	$ 1,806	$ .60
Opening Inventory							57	1.90		
Cost of Product received	—		6,900	2.30	7,350	2.45	8,195	2.75	10,040	3.335
Cumulative Cost	$ 6,900		$ 7,350	$2.45	$ 8,250	$2.75	$10,040	$3.35	$11,846	$3.935
Units Started	3,000		3,000		3,000		2,980		3,010	
Beginning Inventory	0		0		0		30		0	
Completed, not transferred	0		0		20		0		0	
Completed transferred	3,000		3,000		2,980		3,010		3,010	
Cost of Units transferred	$ 6,900		$ 7,350		$ 8,195		$10,040		$11,846	
Cost of Units completed, not transferred	—		—		55		—		—	
Total Cost	$ 6,900		$ 7,350		$ 8,250		$10,040		$11,846	

NOTE: Operation No. 4, unit cost is $3.35 without Beginning Inventory, but after 30 units have been mixed with the new production the unit is actually $3.3355 i.e. With Inventory.

Taxes on Factory	Floor Space	Cubic Capacity
Superintendence	Number of Employees	Arbitrary Division
Fire Insurance on Building	Floor Space	Cubic Capacity
Rent of Factory	Floor Space	Cubic Capacity
Factory Building Depreciation	Floor Space	Cubic Capacity
Repairs to Machinery	Cost of Machinery	Machine Hours — Basis of Repair Hours Used
Light Expense	Number of Lamps — Rate Capacity — Floor Space	
Cost Accounting Expense	Number of Employees — Production — Arbitrary	
Depreciation on Machinery	Cost of Machinery	
General Factory Supplies	Number of Employees — Production — Arbitrary	
Workmen's Compensation Insurance	Direct Labour Cost — Number of Employees	
Storeroom Expense	Basis of expenses already applied Cost of materials issued — volume of materials issued	

COMMENTS:

In addition to the above bases under certain circumstances there were several other alternates. Provided the candidate explained the reasons for the unusual base, these other methods of distribution were accepted, and full marks allowed.

QUESTION V (15 marks)

The following differences were reported in reconciling the physical inventory of stores with the Stores Ledger. This physical inventory has been verified as correct in each case.

	Physical Inventory	Stock Ledger Balance
Material No. 1	2,000 units	2,100 units
	The accountant has neglected to record an issue of material to production. Average cost per unit, $0.20	
Material No. 2	500 units	400 units
	An order of 100 units purchased at $3.00 per unit has not been recorded.	
Material No. 3	1,000 gal.	1,030 gal.
	The shrinkage is a normal condition of storage and material issue; Average cost per gal., $0.20.	
Material No. 4	900 pounds	930 pounds
	Average cost per pound, $10.00. Shortage due to theft.	

REQUIRED:

Entries in General Journal and in the Stores Ledger to correct each of the above differences.

SOLUTION TO QUESTION V

	General Journal			Stock Ledger
Material No. 1	Materials in Process	20.		Issued Section of Stores
	Stores		20.	Ledger Sheet — $ 20.00
Material No. 2	Stores	300.		Received Section of Stores
	Accounts Payable		300.	Ledger Sheet — $300.00
Material No. 3	Mfg. Expense — (Inventory Shrink.)	6.		Issued Section of Stores Ledger Sheet — $ 6.00
	Stores		6.	
Material No. 4	Mfg. Expense — (Material Shortage)	300.		Issued Section of Stores Ledger Sheet — $300.00
	Stores		300.	

(These entries might be shown on a Stores Ledger Account.)